Removal of Debris and Pollutants by COANDA Curb Inlet

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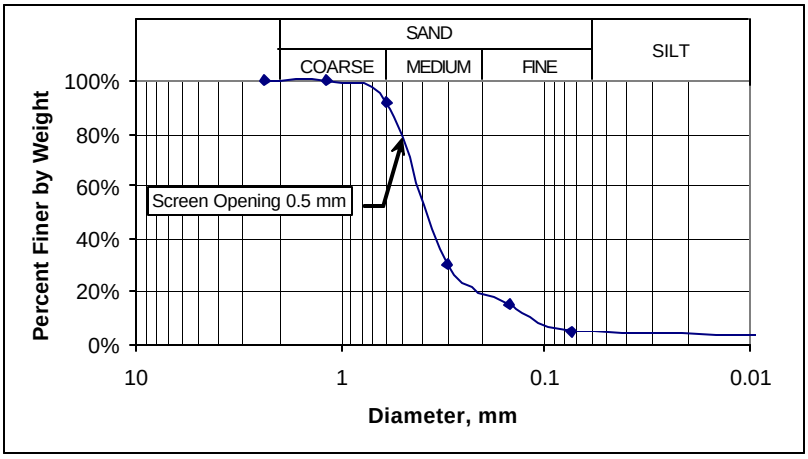
Introduction

The COANDA curb inlet was installed at the University of Southern California (USC) campus and evaluated in a research project during the wet season of 2006[1]. The COANDA curb inlet is a patented BMP meeting the Caltrans definition of a Gross Solids Removal Device (GSRD). It also meets the requirements of a full capture treatment system defined by the Los Angeles River TMDL for trash.

Debris from storm water runoff is removed by the tilted wedge wire screen, openings of 0.5 mm. Following debris removal, storm water flow proceeds through trays underneath the screen where dissolved constituents are removed by Mycelx and 200 micron filtration fabric. Photos of the completed installation are shown below.

Debris removal efficiency was virtually 100%. The captured debris air-dried quickly and remained in a state of dryness. Sieve analysis of the sediment and grass seeds is shown in the following figure. USC collected water quality samples in the curb inlet and discharge, reporting removal efficiencies of various dissolved constituents shown in the table below.



Pollutant	Percent Removal
Turbidity NTU	79
Dissolved Solids	10
Chemical Oxygen Demand	25
Biochemical Oxygen Demand	25
Total Organic Carbon	25
Total Phosphates	--
Total Nitrates	80
Total Iron	72
Zinc	81

Debris was collected from the USC curb following the 2006 wet season and classified. A total of 7.2 lbs of debris was retrieved during this period (less than one cubic foot). The volume of the vault is 129 cu.ft., and the debris compartment is 30 cu.ft. According to LADWP, 4.80 inches of precipitation fell during this period of time. Debris was classified and weighed, the results shown on the following page.

Comparison with Cloth Filters

The first notable difference was that COANDA technology does not block the drainage way, as do the "bag in a box" BMPs which employ cloth filters or other types of filter media. Cloth filter drain inserts sometimes serve as drain plugs during storms, causing the drainage system

[1] Shankar, S.K., Kou, Z., and Lee, J.J., "Hydraulic Performance, Pollutant Removal Efficiencies, and Economic Evaluation of Catch Basin Insert Devices," University of Southern California, April 2006

to fail[2]. Excluders have the same problem, because the state of the art in civil engineering practice is to design the curb inlet without a covering or restriction. By contrast, the accumulated debris does not interfere with the performance of the COANDA screen, yet when restrictions of any sort are placed in the path of cloth filters or excluders, performance is significantly impaired.

	Description	Sieve Size, mm	Wt, kg	Vol, ml	Density, pcf
	Sediment & grass seeds	1.0	1.20	1,700	44
	Mulch, grass, fine bark	5.5	0.74	2,600	18
	Leaves, small sticks		0.84	9,000	6
	Trash: paper, plastics, cans, etc.		0.48	8,000	4
	TOTAL		3.26	21,300	9.5

Second, the debris retained on cloth filters and excluders remains in the flow path, frequently keeping it damp or wet. This is not so with COANDA, since the screen is physically separated from the debris compartment. Bacteria, vector control, and related nuisances are not issues because the collected debris stays dry. No breeding activity was ever detected, no abatement was required, and no special handling techniques were required for cleaning operations. The debris material collected by the COANDA BMP can be disposed as ordinary municipal waste.

Conclusion

The COANDA curb inlet consistently outperforms all other known BMPs for removal of debris. COANDA curb inlets are very economical to retrofit to existing curb inlets, and are easily maintained. Call further information, visit us on the web at www.coanda.com, or direct correspondence to the author at: cesmond@coanda.com.

[2] Angela Galloway, "Flood Victims Say Filters Plugged Drains," Seattle Post-Intelligencer, December 29, 2006